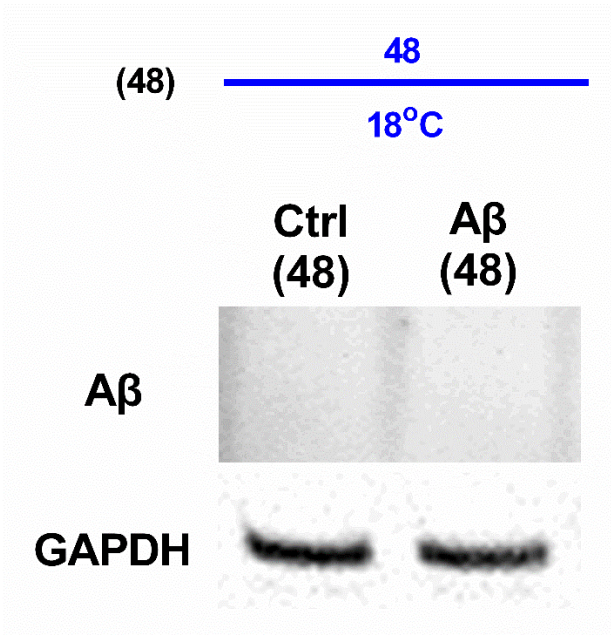


SUPPLEMENTARY DATA

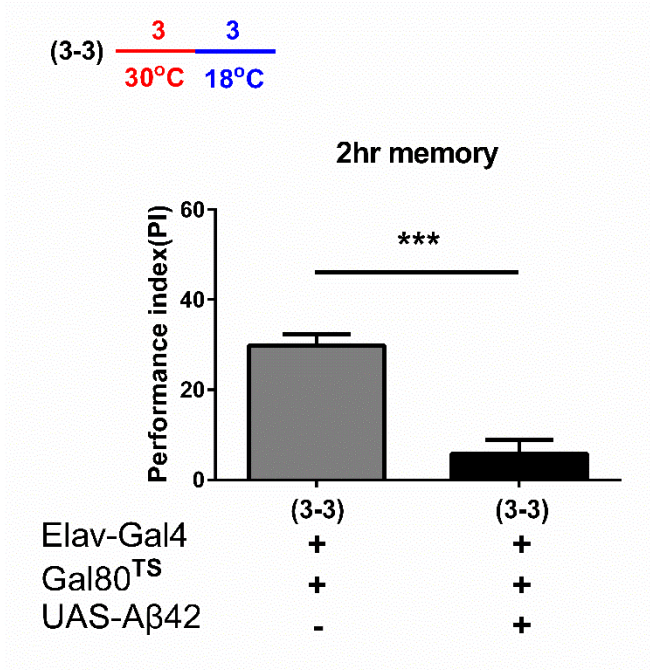
Early A β 42 Exposure Causes Learning Impairment in Later Life

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SUPPLEMENTARY DATA

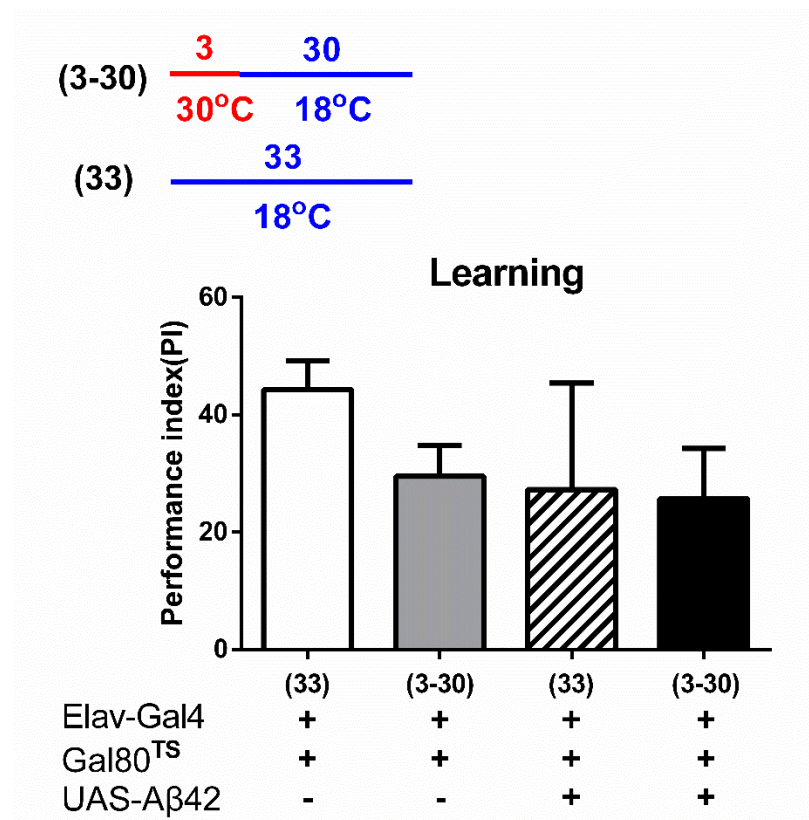


Supplementary Figure 1. No leakage of Aβ expression observed in the permissive temperature. Western blotting data showed that there was no leakage of Aβ expression in the permissive temperature for 48days. *n* = 4 for each group. Ctrl represents Elav-Gal4+Gal80^{TS}.

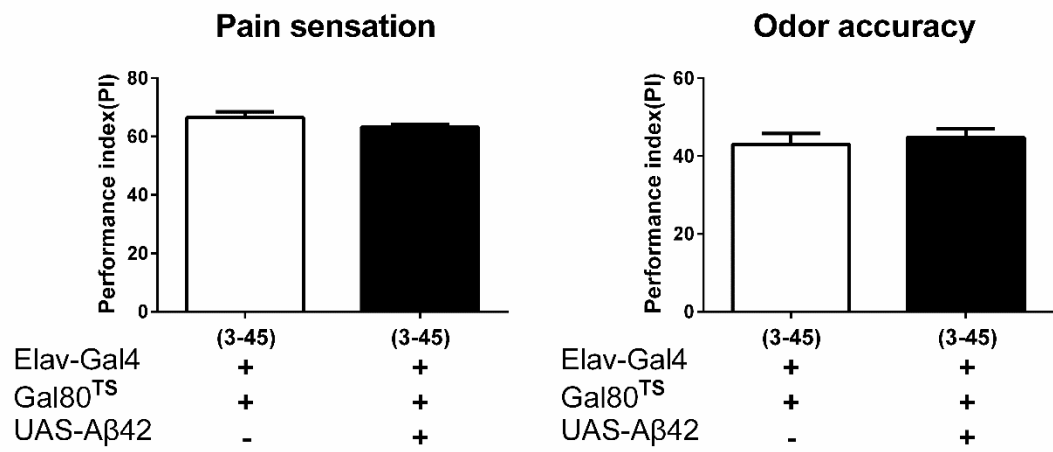


Supplementary Figure 2. The memory damage was occurred in 30°C-18°C Aβ flies. The memory performance was impaired in 30°C-18°C Aβ flies, *N* = 6 respectively.

SUPPLEMENTARY DATA

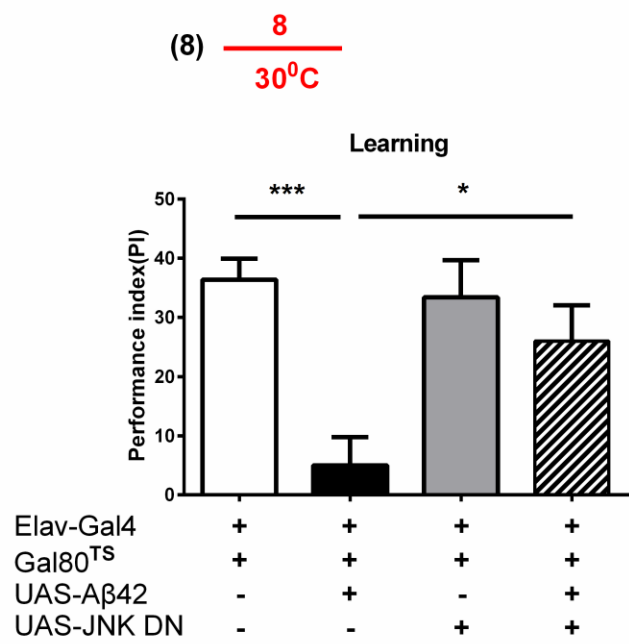


Supplementary Figure 3. The learning impairment was not occurred in 330°C -3018°C Aβ flies. The normal learning ability performed in Aβ group of 330°C -3018°C flies (Ctrl (3-30) vs. Aβ42 (3-30): $p = 0.9943$, $N = 6$ respectively). All Ctrl represents Elav-Gal4+Gal80^{TS}.

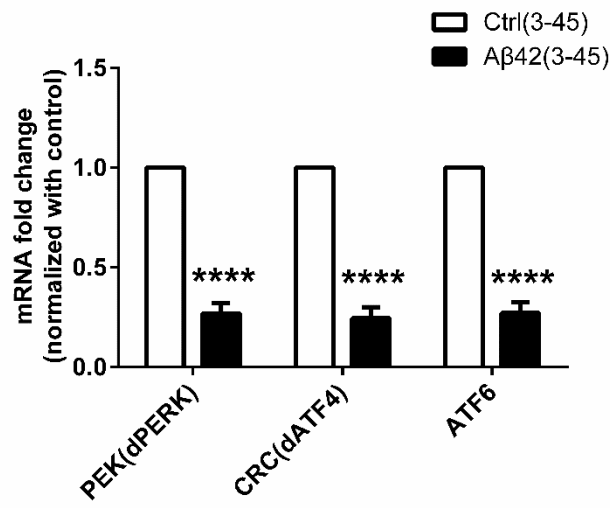


Supplementary Figure 4. Pain sensation and olfactory function are normal in 330°C -4518°C Aβ flies. The normal pain sensation and olfactory function performed in Aβ group of 330°C -4518°C flies, $N = 6$ respectively.

SUPPLEMENTARY DATA

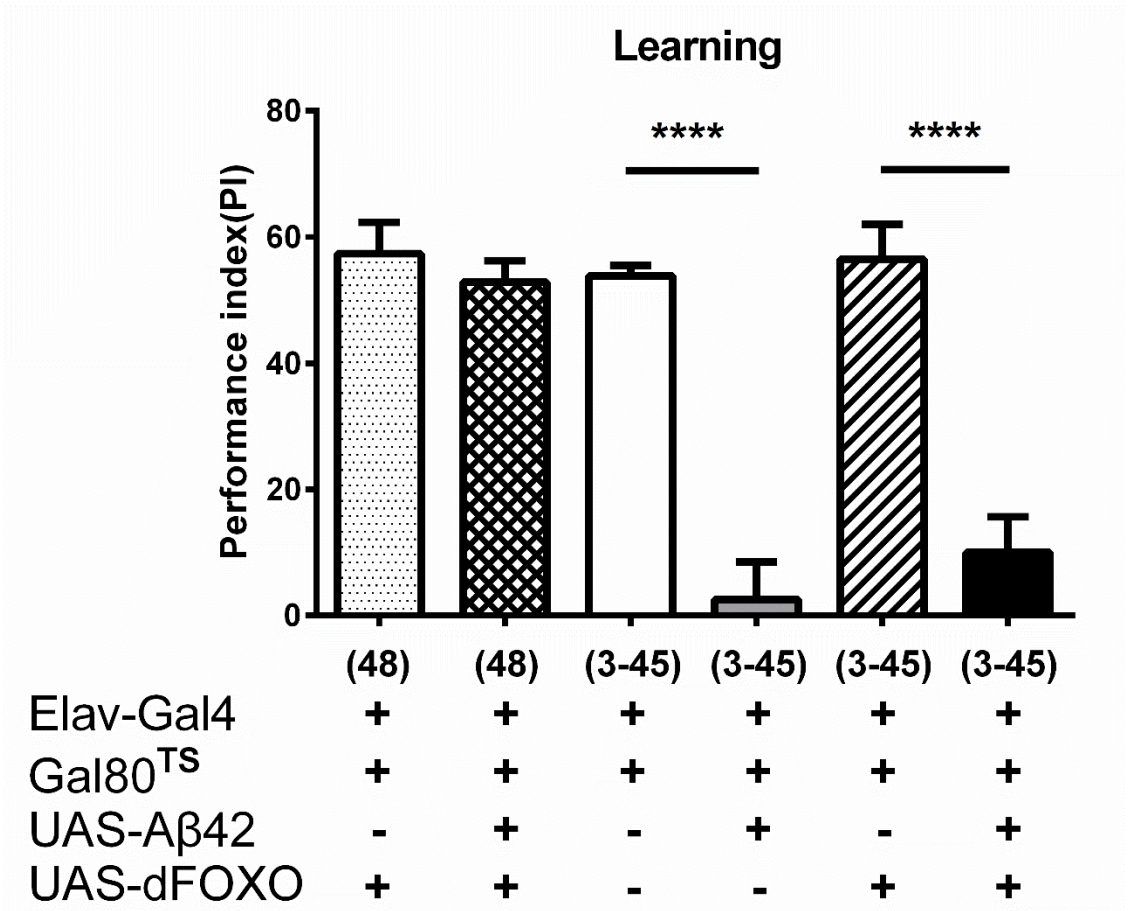


Supplementary Figure 5. Learning impairment was improved by JNK DN overexpression in Aβ flies. Overexpression of JNK DN improved learning impairment in 8dae Aβ flies (Ctrl vs. Aβ42: $p = 0.0004$, respectively; Aβ42 vs. Aβ42+JNK DN: $p = 0.0305$, $N = 6$ respectively). * $p < 0.05$, *** $p < 0.001$. Ctrl represents Elav-Gal4+Gal80^{TS}.



Supplementary Figure 6. The mRNA levels of dPERK, dATF4 and ATF6 were decreased in the 30°C-45°C Aβ flies. Early Aβ induction for 3days reduced mRNA levels of ER stress effectors in the 30°C-45°C Aβ flies, $N = 6$ respectively. **** $p < 0.0001$. All Ctrl represents Elav-Gal4+Gal80^{TS}.

SUPPLEMENTARY DATA



Supplementary Figure 7. FOXO overexpression could not improve learning impairment in 3₃₀[°]C-45₁₈[°]C A β flies. Learning impairment was not improved by dFOXO overexpression in A β group of 3₃₀[°]C -45₁₈[°]C flies (Ctrl (3-45) vs. A β 42 (3-45): $p < 0.0001$ respectively; A β 42 (3-45) vs. A β 42+dFOXO (3-45): $p = 0.8752$, $N = 6$ respectively). **** $p < 0.0001$. ns represents non-significant. Ctrl represents Elav-Gal4+Gal80^{TS}.